

INTERNATIONAL SEARCH REPORT

 International Application No
 PCT/CA2004/000384

 A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C07F9/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 C07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, BEILSTEIN Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	PHAM, VINH ET AL: "Design and Synthesis of Novel Pyridoxine 5'-Phosphonates as Potential Antiischemic Agents" JOURNAL OF MEDICINAL CHEMISTRY, vol. 46, no. 13, 14 August 2003 (2003-08-14), XP002287091 ISSN: 0022-2623 the whole document	1,4-9, 12,15, 17,18, 21,24, 30,31,44
X	COCKERILL, G. STUART ET AL: "Facile syntheses of building blocks for the construction of phosphotyrosine mimetics" PERKIN 1, no. 16, 2000, pages 2591-2599, XP002287092 ISSN: 0300-922X compound 22c	1,13

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

13 July 2004

Date of mailing of the international search report

22/07/2004

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>COCKERILL, STUART G. ET AL: "Facile syntheses of aryldifluorophosphonate building blocks" TETRAHEDRON LETTERS, vol. 40, no. 13, 26 March 1999 (1999-03-26), pages 2601-2604, XP004158095 ISSN: 0040-4039 compound 10 where Ar = 2-pyridyl</p>	1,13
X	<p>PATENT ABSTRACTS OF JAPAN vol. 017, no. 345 (C-1077), 30 June 1993 (1993-06-30) -& JP 05 043589 A (OTSUKA PHARMACEUT FACTORY INC), 23 February 1993 (1993-02-23) compounds 1, 5, 11 and 12 abstract</p>	1,13,24, 37,41,44
X	<p>WO 01/64692 A1 (MEDICURE INTERNATIONAL) 7 September 2001 (2001-09-07) cited in the application</p> <p>claims 1-60,120-180; examples 3,6,7,22</p>	1,8-10, 14,15, 18,22, 24,28-44
X	<p>WO 01/72309 A2 (MEDICURE INTERNATIONAL) 4 October 2001 (2001-10-04)</p> <p>claims 32-41,51-61.65.67; examples 3,6,7,22</p>	1,8-10, 12,17, 18,22, 24, 29-32, 34,44
X	<p>FRECHETTE, ROGER F. ET AL: "Novel hydroxyphosphonate inhibitors of CD-45 tyrosine phosphatase" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, vol. 7, no. 17, 9 September 1997 (1997-09-09), pages 2169-2172, XP004136407 ISSN: 0960-894X Table 1, entries 13-16</p>	1,11-14, 22,24
X	<p>BODUSZEK, BOGDAN: "The acidic cleavage of pyridylmethyl(amino)phosphonates. Formation of the corresponding amines" TETRAHEDRON, vol. 52, no. 38, 16 September 1996 (1996-09-16), pages 12483-12494, XP002287093 ISSN: 0040-4020 page 12490, compounds 17 - 22</p>	1,8, 11-13
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KONDO, KOICHI ET AL: "Synthesis of optically quadratic nonlinear phenylpyridylacetylenes" JOURNAL OF ORGANIC CHEMISTRY, vol. 57, no. 5, 28 February 1992 (1992-02-28), pages 1622-1625, XP002287094 ISSN: 0022-3263 compound 1	1,10,11
X	----- EIDENHAMMER G ET AL: "Enzymes in organic chemistry, part 4: enantioselective hydrolysis of 1-acyloxy(aryl)methyl- and 1-acyloxy(heteroaryl)methylphosphonates with lipases from Aspergillus niger and Rhizopus oryzae. A comparative study" SYNTHESIS, no. 6, June 1996 (1996-06), pages 748-754, XP001182245 ISSN: 0039-7881 compounds 3l & 3m	1,8,12
X	----- PUDOVNIK A N ET AL: "Synthesis of alkyl (3-pyridyl)hydroxymethylphosphonates and their IR spectra" RUSSIAN CHEMICAL BULLETIN, vol. 43, no. 9, September 1994 (1994-09), pages 1584-1586, XP009033070 ISSN: 1066-5285 compounds 1-4 -----	1,8,12

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1-21, 24-44 (all partially)
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 28-42 are directed to methods of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compounds.
2. ☒ Claims Nos.: 1-21, 24-44 (all partially)
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Although claims 28-42 are directed to methods of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compounds.

Continuation of Box II.1

Claims Nos.: 1-21, 24-44 (all partially)

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

Continuation of Box II.2

Claims Nos.: 1-21, 24-44 (all partially)

The initial phase of the search revealed a very large number of documents relevant to the issue of novelty of present claims 1-21 (the document referred to in paragraph '0003! of the application, W001/64692, is seen to disclose a number of novelty-destroying compounds - cf. the compounds prepared in Examples 3, 6, 7 and 22). Some statement as to the definite presence of a phosphonate substituent in the compounds of claim 1 is obviously missing as without such a statement, the claim encompasses pyridine ($R_1=R_2=R_3=R_4=R_5=H$). So many documents were retrieved that it was impossible to determine which parts of the claims may be said to define subject-matter for which protection might legitimately be sought (Article 6 PCT). For these reasons, a meaningful search over the whole breadth of the claims is impossible. Consequently, the search has been restricted to compounds clearly supported and disclosed by the application, i.e. to compounds seen as having the technical features of the exemplified compounds, namely compounds in which one of the stated phosphonate substituents is present and in which at least one of X and Y is either a hydroxy group or a fluoro group.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

overcome.

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 05043589	A	23-02-1993	JP 2696150 B2	14-01-1998
WO 0164692	A1	07-09-2001	AU 3718501 A	12-09-2001
			CA 2401655 A1	07-09-2001
			EP 1268498 A1	02-01-2003
			JP 2003525303 T	26-08-2003
			US 2003114677 A1	19-06-2003
			US 2003114678 A1	19-06-2003
			US 2003120074 A1	26-06-2003
			US 2003181422 A1	25-09-2003
			US 2002010158 A1	24-01-2002
WO 0172309	A2	04-10-2001	AU 4870301 A	08-10-2001
			CA 2404329 A1	04-10-2001
			EP 1278526 A2	29-01-2003
			JP 2003528146 T	24-09-2003
			US 2003114424 A1	19-06-2003
			US 2001056081 A1	27-12-2001